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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,238	12/02/2003	Thorsten Feiweier	P03,0478	3519

7590 10/17/2005

SCHIFF HARDIN & WAITE
Patent Department
6600 Sears Tower
233 South Wacker Drive
Chicago, IL 60606

EXAMINER	
FETZNER, TIFFANY A	

ART UNIT	PAPER NUMBER
2859	

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/726,238	FEIWEIER, THORSTEN	
	Examiner	Art Unit	
	Tiffany A. Fetzner	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 December 2003 See 948* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED Final ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings & Specification

2. The drawing and specification objections from the May 17th 2005 Office action are rescinded in view of the amendments to the specification from the August 4th 2005 amendment, which resolve the objections via the amendments made to the specification, (i.e. figure 9 is now referenced in applicant's disclosure, and the antecedence for "scanner" component 2 is now consistently maintained).

Claim Objections

3. The objection to **claim 2** from the May 17th 2005 Office action is rescinded in view of the August 4th 2005 amendment of claim 2, which now amends claim 2 so that it corresponds to the antecedence provided from the preliminary amendment of May 3rd 2004.

Response to Arguments

4. Applicant's arguments with respect to **Amended claims 1-19** from the August 4th 2005 amendment have been considered but are moot in view of the new ground(s) of rejection, necessitated by applicant's amendment.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 1-3, 5-8,** and **11-19** are rejected under **35 U.S.C. 102(e)** as being anticipated by **Yablonskiy** US Patent 6,603,989 B1 issued August 5th 2003, filed

November 1st 2000, with an effective US priority date from US provisional application 60/190,994 of **March 21st 2000**. The date of the **Yablonskiy** reference, which is being applied by the examiner, is the US effective date of this prior art reference is **March 21st 2000**. as per the AIPA rules of 1999 and the international property and technology act of 2002.

7. With respect to **Claim 1**, **Yablonskiy** teaches and shows " A method for determining a field strength of radio-frequency energy emitted during a magnetic resonance measurement" {See col. 14 line 45 through col. 15 line 39; which relies upon equations [14] through [17] of the **Yablonskiy** disclosure and the explanation of the use of these equations from col. 11 line 6 through col. 13 line 35. The examiner notes that the emission of radio frequency energy during a magnetic resonance measurement" is taught from **Yablonskiy** col. 5 lines 3-24. The RF coil 56 is functionally both a transmitting and receiving antenna controlled by transmit / receive switch 62, as per **Yablonskiy** col. 4 lines 37-53. **Yablonskiy** teaches that 'the use of the phase from the detected MR signal' (i.e. the phase of the detected RF MR signal) 'allows the calculation of the "average magnetic field for each voxel, B(x,y,z) by fitting the phase of each voxel to equation [18] which in turn allows the spatial distribution of the magnetic field inside any given voxel to be evaluated'. [See **Yablonskiy** col. 14 lines 52-59] The examiner considers the 'average magnetic field for each voxel B(x,y,z)' to be a measurement of the RF magnetic field strength (B), emitted and detected by the RF coil 56, for each voxel emitted in three-dimensional Cartesian coordinate space during the **Yablonskiy** MR measurements.}

8. **Yablonskiy** also teaches steps "comprising the steps of: from an antenna of a magnetic resonance examination apparatus", (i.e. from transmit / receive RF coil 56) "~~generating a radio-frequency field having a field strength associated therewith by~~ emitting at least one radio-frequency pulse from said antenna to generate an antenna-emitted radio-frequency field having a field strength, and thereby causing an examination subject in said radio-frequency field to emit a magnetic resonance signal;" [See **Yablonskiy** col. 4 lines 37-53; col. 5 lines 3-24; RF coil 56; and the RF pulse sequences of figures 2 and 3.] **Yablonskiy** also teaches and shows "receiving said

magnetic resonance signal;" [See **Yablonskiy** RF coil 56; col. 4 lines 37-53; col. 5 lines 3-24; and the RF pulse sequences of figures 2 and 3.] "and determining a phase of said magnetic resonance signal and, from said phase, determining said field strength, of said antenna-emitted radio-frequency field." {See col. 14 line 45 through col. 15 line 39; which relies upon equations [14] through [17] of the **Yablonskiy** disclosure and the explanation of the use of these equations from col. 11 line 6 through col. 13 line 35, and the detailed explanation in the preceding paragraph}.

9. With respect to **Amended Claim 2**, **Yablonskiy** teaches and shows "**exciting** said magnetic resonance signal in said subject in a spatially resolved manner within a measurement volume" [See **Yablonskiy** col. 6 line 1 through col. 15 line 49], "and determining a spatially-dependent phase of the magnetic resonance signal" [See **Yablonskiy** col. 14 lines 47-67] "and determining said field strength as a function of a location within said measurement volume." [See **Yablonskiy** col. 14 line 47 through col. 11 line 6 through col. 13 line 35.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 2** and need not be reiterated.

10. With respect to **Claim 3**, **Mills** teaches and shows "**receiving** said magnetic resonance signal in said subject in a spatially resolved manner within a measurement volume" [See **Yablonskiy** col. 6 line 1 through col. 15 line 49], "and determining a spatially-dependent phase of the magnetic resonance signal" [See **Yablonskiy** col. 14 lines 47-67] "and determining said field strength as a function of a location within said measurement volume" [See **Yablonskiy** col. 14 line 47 through col. 11 line 6 through col. 13 line 35.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 3** and need not be reiterated.

11. With respect to **Claim 5**, **Yablonskiy** teaches, "receiving said magnetic resonance signal in a gradient echo technique", [See **Yablonskiy** col. 14 lines 24-27; col. 5 lines 37-41; col. 10 lines 45-62.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 5** and need not be reiterated.

12. With respect to **Claim 6**, **Yablonskiy** teaches and shows "phase-modulating said at least one radio-frequency pulse" because **Yablonskiy** teaches [See **Yablonskiy** col. 11 lines 6-26] that during each pulse sequence repetition that the phase is incremented,

or changed which is an equivalent way of stating that the phase is 'modulated' since any change in the phase encoding is effectively a "modulation' of the phase. [See also **Yablonskiy** figures 2 and 3 in combination with the teachings of col. 11 lines 6-26 and col. 13 lines 1-35.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 6** and need not be reiterated.

13. With respect to **Claim 7**, **Yablonskiy** teaches and shows (i.e. from figures 2 and 3 components 86, 96, 116 and 124; col. 13 lines 1-35; and col. 11 lines 6-26) the step of "employing a phase-modulated rectangular pulse as said at least one radio-frequency pulse", from the timing diagrams of the taught sequences which are incremented for each repetition. The same reasons for rejection, that apply to **claims 1, 6** also apply to **claim 7** and need not be reiterated.

14. With respect to Amended **Claim 8**, **Yablonskiy** teaches "receiving said magnetic resonance signals in respectively separate measurements and, for each measurement, determining the phase of the magnetic resonance signal, and determining a phase difference between the respective phases ~~phase positions~~ from two of said measurements and determining said field strength dependent on said phase difference". [See **Yablonskiy** col. 7 lines 57-67; col. 11 line 6 through col. 11 line 35; and col. 14 line 48 through col. 15 line 39; and figure 4.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 8** and need not be reiterated.

15. With respect to **Claim 11**, **Yablonskiy** teaches and shows "the step of emitting at least one radio-frequency pulse comprises emitting at least one short, intensive radio-frequency pulse." [See **Yablonskiy** col. 9 line 34 through col. 10 line 17, figures 2 and 3.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 11** and need not be reiterated.

16. With respect to **Claim 12**, **Yablonskiy** teaches and shows that "said magnetic resonance examination apparatus has a basic magnetic field associated therewith", [See **Yablonskiy** figures 1, 2, 3; col. 5 lines 3-24; col. 1 lines 19-32] "said basic magnetic field exhibiting spatially-dependent field inhomogeneities" [See **Yablonskiy** col. 6 line 1 through col. 9 line 12], "and wherein the step of determining said field strength comprises determining a spatially-dependent field strength taking said

spatially-dependent field inhomogeneities into account" [See **Yablonskiy** col. 6 line 1 through col. 9 line 12; col. 11 line 6 through col. 13 line 35; col. 14 line 47 through col. 15 line 39], The same reasons for rejection, that apply to **claim 1** also apply to **claim 12** and need not be reiterated.

17. With respect to **Claim 13**, **Yablonskiy** teaches "the step of determining said field strength comprises determining a spatially-dependent field strength for a group of adjacent voxels by identifying the phase of respective magnetic resonance signals for individual voxels in said group and combining the respective phases into a common phase, and determining the field strength for said voxel group from said common phase." [See **Yablonskiy** col. 14 lines 47 through col. 15 line 39; col. 11 line 6 through col. 13 line 35; equations [14] through [22]; figures 1 through 4]. The same reasons for rejection, that apply to **claim 1** also apply to **claim 13** and need not be reiterated.

18. With respect to **Claim 14**, **Yablonskiy** teaches and shows that "each of the magnetic resonance signals for the individual voxels has an amplitude", [See **Yablonskiy** col. 14 lines 45 through col. 15 line 39; where the use of amplitude and phase in combination starts in col. 14 line 45.] "and comprising weighting the phase dependent on the amplitude of the associated magnetic resonance signal" [See **Yablonskiy** col. 14 lines 45 through col. 15 line 39; col. 11 line 6 through col. 13 line 35; equations [14] through [22]; figures 1 through 4]. The same reasons for rejection, that apply to **claims 1, 13** also apply to **claim 14** and need not be reiterated.

19. With respect to **Claim 15**, **Yablonskiy** teaches and shows "the step of determining said field strength comprises determining a spatially-dependent field strength for a group of adjacent voxels by identifying the phase difference of respective magnetic resonance signals for individual voxels in said group and combining the respective phase differences into a common phase difference, and determining the field strength for said voxel group from said common phase difference". [See **Yablonskiy** col. 14 lines 45 through col. 15 line 39; col. 11 line 6 through col. 13 line 35; equations [14] through [22]; figures 1 through 4; and col. 7 line 57 through col. 9 line 13]. The same reasons for rejection, that apply to **claim 1** also apply to **claim 15** and need not be reiterated.

20. With respect to **Claim 16**, **Yablonskiy** teaches and shows "each of the magnetic resonance signals for the individual voxels has an amplitude" [See **Yablonskiy** col. 14 lines 45 through col. 15 line 39; where the use of amplitude and phase in combination starts in col. 14 line 45.] "and comprising weighting the phase difference dependent on the amplitude of the associated magnetic resonance signal." [See **Yablonskiy** col. 14 lines 45 through col. 15 line 39; col. 11 line 6 through col. 13 line 35; equations [14] through [22]; figures 1 through 4]. The same reasons for rejection, that apply to **claims 1, 15** also apply to **claim 16** and need not be reiterated.

21. With respect to **Claim 17**, **Yablonskiy** teaches and shows "employing said field strength determined from said phase to optimize said field strength in a predetermined volume region of the subject. [See **Yablonskiy** col. 7 line 57 through col. 9 line 13; col. 14 lines 45 through col. 15 line 39; col. 11 line 6 through col. 13 line 35; equations [14] through [22]; figures 1 through 4]. The same reasons for rejection, that apply to **claim 1** also apply to **claim 17** and need not be reiterated.

22. With respect to **Amended Claim 18**, **Yablonskiy** teaches and shows "magnetic resonance examination apparatus comprising: a magnetic resonance scanner adapted to receive a subject therein, said magnetic resonance scanner having a radio-frequency antenna;" [See **Yablonskiy** figure 1 col. 3 line 53 through col. 9 line 12; col. 1 line 12 through col. 3 line 29.] "a control computer for operating said magnetic resonance scanner, including operating said radio-frequency antenna;" [See **Yablonskiy** computer system 20, system control 32 and CPU 36, figure 1; col. 3 line 53 through col. 9 line 12; col. 1 line 12 through col. 3 line 29.] "and said control computer operating said magnetic resonance scanner and said radio-frequency antenna to ~~produce a radio-frequency field, having a field strength, by emitting~~ emit at least one radio-frequency pulse from said radio-frequency antenna to generate an antenna-emitted radio-frequency field having a field strength, and thereby exciting a magnetic resonance signal from said subject, ~~for acquiring~~ and to acquire said magnetic resonance signal, ~~for~~ said control computer determining a phase of said magnetic resonance signal, and ~~for~~ determining said field strength of said antenna-emitted radio-frequency field from said phase." [See the **rejection of claim 1**, figures 1-4 col. 3 line 53 through col. 9 line 12; col. 1 line 12

through col. 3 line 29; and the entire disclosure of the **Yablonskiy** reference in general, especially the detailed explanation of col. 2 line 20 through col. 15 line 39.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 18** and need not be reiterated.

23. With respect to **Amended Claim 19**, **Yablonskiy** teaches and shows "computer program product loadable into a control computer of magnetic resonance examination apparatus having a radio-frequency antenna operated by said control computer" [See page 25 paragraph [0231 through page 35 paragraph [1003], "said computer program product running in said control computer and causing said control computer to: operate said antenna to ~~produce a radio-frequency field, having a field strength, by emitting~~ emit at least one radio-frequency pulse from said radio-frequency antenna to generate an antenna-emitted radio-frequency field having a field strength, and thereby exciting a magnetic resonance signal in a subject in said field; to acquire said magnetic resonance signal; and to determine a phase of said magnetic resonance signal and to determine said field strength of said antenna-emitted radio-frequency field from said phase ~~position~~." See the **rejection of claim 1**, figures 1-4 col. 3 line 53 through col. 9 line 12; col. 1 line 12 through col. 3 line 29; and the entire disclosure of the **Yablonskiy** reference in general, especially the detailed explanation of col. 2 line 20 through col. 15 line 39. The specific use of a computer program for performing the method of **Yablonskiy** is taught in col. 3 lines 16-29.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 18** and need not be reiterated.

Claim Rejections - 35 USC § 103

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

25. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

26. **Claims 4, 9** and **10**, are rejected under **35 U.S.C. 103(a)** as being unpatentable over **Yablonskiy** US Patent 6,603,989 B1 issued August 5th 2003, filed November 1st 2000, with an effective US priority date from US provisional application 60/190,994 of **March 21st 2000**. The date of the **Yablonskiy** reference, which is being applied by the examiner, is the US effective date of this prior art reference is **March 21st 2000**. as per the AIPA rules of 1999 and the international property and technology act of 2002; in further view of mills **Mills** US Patent Application Publication 2004/0027127 A1 published February 12th 2004, with an effective priority from an English 2001 US designating PCT with an international filing date of August 21st 2001, and an effective US priority date of **August 22nd 2000**. The date of the **Mills** reference which is being applied by the examiner is the US effective date of this prior art reference is **August 22nd 2000** as per the AIPA rules of 1999 and the international property and technology act of 2002.

27. With respect to **Claim 4**, **Yablonskiy** teaches and shows that "said at least one radio-frequency pulse produces a flip angle" (i.e. the taught flip angles of **Yablonskiy** comprise 90 degrees, 180 degrees or in the example of col. 14 lines 10-12 80 degrees), "of nuclear spins in said subject" [See **Yablonskiy** figures 2 and 3, col. 9 line 34 through col. 10 line 17; col. 14 lines 10-12],

28. **Yablonskiy** lacks directly teaching "determining said flip angle from said phase and determining said field strength dependent on said flip angle." However, the Mills reference teaches this limitation. [See **Mills** page 7 paragraph [0075] through page 8 paragraph [0082], page 9 paragraph [0092] through page 11 paragraph [0101], where the secondary H1 or B1 magnetic field is sampled, the flip angle φ_{H1} is determined, and the intensity (i.e. strength) of the transverse magnetic field H1, of the set of

measurements is associated specifically by phase, (i.e. each phase is representative of an different angle or angular component).] The examiner notes that the flip angle which is preferred in **Mills** is a flip angle of 90 degrees / a CPMG sequence of 90,180,180, ... However, **Mills** also teaches that any NMR pulse sequences which provide the signals for a t1 or t2 image may be applied. [See **Mills** page 11 paragraph [0109]] Therefore the ability to employ the known FLASH method of the prior art with flip angles less than 90 degrees, or field gradients (i.e. gradient echoes) with dynamic phase dispersion, corresponding to the rotation of the field gradient (i.e. the gradient echo), during a single free induction decay (FID), [See **Mills** page 1 paragraph [0004], which are sequences normally used for T1 and t2 imaging [See page 10 paragraph [0097] through paragraph [0100]], are also part of the teachings of the **Mills** reference.

29. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the teaching of **Yablonskiy** with the teaching of **Mills** because **Yablonskiy** teaches a pulse sequence which permits t1, t2, t2*, or spin density images to be acquired in a single sequence, and **Yablonskiy** teaches the use of flip angles less than 90 degrees (i.e. 80 degrees, from **Yablonskiy** col. 14 lines 10-12) which is similar to the **Mills** teaching of the ability to employ the known FLASH method of the prior art with flip angles less than 90 degrees, or field gradients (i.e. gradient echoes) with dynamic phase dispersion, corresponding to the rotation of the field gradient (i.e. the gradient echo), during a single free induction decay (FID), [See **Mills** page 1 paragraph [0004], which are sequences normally used for T1 and t2 imaging [See **Mills** page 10 paragraph [0097] through paragraph [0100]]. Therefore, the ability to employ the **Yablonskiy** gradient echo method for performing t1, t2, t2*, or spin density images to be acquired in a single sequence, with the **Mills** gradient echo teachings, to conduct t1 and t2 imaging, would have been readily obvious to one of ordinary skill in the art at the time that the invention was made. The same reasons for rejection, that apply to **claim 1** also apply to **claim 4** and need not be reiterated.

30. With respect to **Claim 9**, **Yablonskiy** lacks directly teaching "employing measurements, as said separate measurements, that are identical except for the at least one radio-frequency pulse", because in the exemplary embodiment with each

separate repetition of the sequence, such as in figures 2 and 3; and col. 11 line 6 through col. 13 line 35, the **Yablonskiy** reference increments the phase.

31. However, **Mills** teaches and shows the step of "employing measurements, as said separate measurements, that are identical except for the at least one radio-frequency pulse. [See **Mills** paragraph [0033] on pages 4 and 5 where each measurement made the antenna detector array and associated by phase, is independent (i.e. separate) and in parallel to the other measurements.] The use of CPMG sequence, which has a 90-degree pulse, followed by a series of 180-degree pulses, where only the initial RF pulse differs also meets this limitation. [See **Mills** page 11 paragraph [0109]. Additionally teachings of **Mills** page 10 paragraph [0098] through page 25 paragraph [0230] explain in depth how the parallel-detected measurements are identical except for varying unique phase that results from the secondary applied H1 magnetic field.

32. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the teaching of **Yablonskiy** with the teaching of **Mills** because **Yablonskiy** teaches a pulse sequence, which permits t1, t2, t2*, or spin density image data to be acquired from the implementation of a single pulse sequence, but also teaches that this pulse sequence shown in figure 2 as a 2D sequence, and shown in figure 3 as a 3D sequence should be repeated Np times, and that the type of image produced is dependent upon the repetition time and the flip angle α. [See **Yablonskiy** col. 11 line 6 through col. 13 line 35; col. 10 lines 9-17] **Yablonskiy** teaches the use of flip angles less than 90 degrees (i.e. 80 degrees, from **Yablonskiy** col. 14 lines 10-12) which is similar to the **Mills** teaching of the ability to employ the known FLASH method of the prior art with flip angles less than 90 degrees, or field gradients (i.e. gradient echoes) with dynamic phase dispersion, corresponding to the rotation of the field gradient (i.e. the gradient echo), during a single free induction decay (FID), [See **Mills** page 1 paragraph [0004], which are sequences normally used for T1 and t2 imaging [See **Mills** page 10 paragraph [0097] through paragraph [0100]]. **Yablonskiy** also teaches the ability to use a 90-degree pulse followed by a 180-degree pulse. [See **Yablonskiy** col. 9 line 34 through col. 10 line 17.] Therefore, the ability to

employ the **Yablonskiy** gradient echo / spin echo method for performing multiple (i.e. essentially parallel measurements) within the same sequence, for acquiring t1, t2, t2*, or spin density image data, with the **Mills** parallel gradient echo acquisition teachings, for conducting t1 and t2 imaging, would have been readily obvious to one of ordinary skill in the art at the time that the invention was made. The same reasons for rejection, that apply to **claims 1, 8** also apply to **claim 9** and need not be reiterated.

33. With respect to **Claim 10**, **Yablonskiy** shows from figures 2 and 3 the step of "emitting said at least one radio-frequency pulse in one of said measurements that starts with a phase, and shifting said phase after a time by a value in a shifted direction, and emitting said at least one radio-frequency pulse in another of said measurements that starts with said phase, and shifting said phase after said time by said value in a direction opposite to said shifted direction." [See the timing diagrams depicted which indicate the phase / polarity changeability of "said at least one radio-frequency pulse in one of said measurements that starts with a phase, and shifting said phase after a time by a value in a shifted direction, and emitting said at least one radio-frequency pulse in another of said measurements that starts with said phase, and shifting said phase after said time by said value in a direction opposite to said shifted direction."]. The same reasons for rejection, obviousness, and motivation to combine that apply to **claims 1, 8, 9** also apply to **claim 10** and need not be reiterated.

Prior art of Record

34. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) **Mills** International PCT publication WO 02/16956 A1 published February 28th 2002, which corresponds to the 79 pages of the United States **Mills** reference applied above as prior art. The examiner notes that this international publication is 170 pages in length. For the sake of brevity the shorter US Pre- Grant Publication was applied, but the same teachings are rejections can also be made with this international reference, which potentially qualifies as art 35 USC under 102 (b), and 35 USC 103 (a).

B) **Kasuboski et al.,** US patent 5,345,175 issued September 6th 1994.

C) **Feiweier** US patent application publication 2004/0164737 A1 published August 26th 2004, filed December 3rd 2003, which corresponds to applicant's instant application, which is noted for the purposes of a complete record only. This reference is not available as prior art against the claims of the instant application.

D) ***Frahm et al.**, US patent 4,707,658 issued November 17th 1987.

35. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

36. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this **final action**.

Conclusion

37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

38. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(571) 273-8300**.

Tiffany A. Fetzner

TAF
October 12, 2005

Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800